THE EFFECTIVENESS OF KINESIOLOGY TAPING WITH EXERCISES AND RIGID TAPING WITH EXERCISES ON SHOULDER IMPINGEMENT SYNDROME AMONG CRICKET PLAYERS

- A Comparative Study

DISSERTATION

Submitted for the partial fulfillment of the requirement for the degree of

MASTER OF PHYSIOTHERAPY (MPT)

(Elective-MPT sports**)**

By

Regn. No: 271550222

Submitted to:

THE TAMILNADU Dr.M.G.R MEDICAL UNIVERSITY

CHENNAI – 600032.

April – 2017

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Date:

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Seal & Signature of Principal

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Prof.S.Paranthaman, MPT.,

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CERTIFICATE

MOHAMED SATHAK A.J COLLEGE OF PHYSIOTHERAPY

Nungambakkam, Chennai – 600034.

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…… ……..…….

Internal Examiner External Examiner

Place:

Date:

DECLARATION BY THE CANDIDATE

I hereby declare that the Dissertation entitled "**THE EFFECTIVENESS OF KINESIOLOGY TAPING WITH EXERCISES AND RIGID TAPING WITH EXERCISES ON SHOULDER IMPINGEMENT SYNDROME AMONG CRICKET PLAYERS – A Comparative Study"** was done by me for the partial fulfillment of the requirement of Master of Physiotherapy degree. The dissertation had been done under the direct supervision and guidance of my Guide at **Mohamed Sathak A.J college of Physiotherapy**, Chennai, and submitted the same during the year April 2017 to **The Tamilnadu Dr. M.G.R Medical University**.

Date :

Place : Chennai

…..…….

Signature of the Candidate

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ABSTRACT

BACKGROUND: There is a relationship between shoulder impingement syndrome and scapular dyskinesia. In which the biceps and sub acromial bursa gets impinged by the acromion process. There is a strong relation in correcting the scapular dyskinesia for shoulder impingement syndrome.

OBJECTIVE: To compare kinesiology taping and rigid taping with exercises in correcting the shoulder impingement syndrome.

STUDY DESIGN : experimental design.

SUBJECTS: 30 male cricketers Group-A subjects were given kinesiology taping with exercises and Group-B were given rigid taping with exercises, both the groups received therapy for four weeks and were asked to come for three days in a week.

OUTCOME MEASURES:

Numerical pain rating scale.(NRS)

Functional throwing performance index.(FTPI)

RESULTS: Among **Group**-A there is a significant difference in post test results of all outcome measure compared to the Group-B, that is with Numerical Rating Scale(NRS) and Functional Throwing Performance index (FTPI)

CONCLUSION: kinesiology taping shows very good effect in managing and treating shoulder impingement syndrome.

INTRODUCTION

Impingement syndrome is characterized by pain in the shoulder due to inflammation of the tendons of the rotator cuff or the bursa (sub acromial bursa) that sits between the rotator cuff and the roof of the shoulder (acromion) [1] Sub acromial impingement syndrome is the most common shoulder complaint in overhead sports. (44–65%) **(Michener al., 2003)** and the most frequent cause of shoulder pain in over-arm athletes **(Jobe et al., 2000).**[2]

In addition, the role of the scapular control in the impingement problems of the over-arm athletes has aroused major interests after the **Kibler's report**[3]**.**

Studies have revealed that scapular dysfunction might lead to a vicious cycle involving micro trauma and chronic pain conditions and relate to the shoulder pain in throwing related sports **(Kibler and McMullen, 2003). Cools et al. (2003) and Ludewig and cook (2000)** observed inhibition of the serratus anterior and lower trapezius, and over activation of the upper trapezius muscle in the subjects with shoulder impingement syndrome. **Tai et al. (2005)**[4]**.**

In a pilot study of 22 patients with unilateral shoulder pain of more than six weeks, **Miller et al (2009)** compared rigid taping as an adjunct to usual physical therapy with usual physical therapy alone. They found a strong trend toward reduced pain and improved function in favor of scapular taping at two weeks. Three studies have examined the clinical effects of taping patients with shoulder impingement syndrome using leukotape in combination with fixomull stretch[5].

Kinesiology has been investigated both by research and the clinical practice, especially with regard to its effects on pain; however, results to date are not yet well established. While some authors have observed pain relief after kinesiology tape, many authors have not observed differences in pain scores, although observing improvement in shoulder muscle activity of athletes with shoulder impingement syndrome[6]. **Aliah F. Shaheen (2014)** has examined the immediate effect of kinesiology taping and rigid taping on shoulder impingement syndrome[7]

NEED FOR THE STUDY

There is a strong evidence showing that there is a relationship between scapular dyskinesia and shoulder impingement syndrome. In which there are studies showing that there is an immediate effect in the pain and the movements of the scapula. But there are no proper evidence showing the long term effects of kinesiology taping and rigid taping on shoulder impingement syndrome. The primary need of the study is to compare the long term effect of kinesiology taping and rigid taping techniques combined with exercises.

AIM OF THE STUDY

Aim of the study is to compare the effects of kinesiology taping with exercises and rigid taping with exercises on shoulder impingement Syndrome among cricket players.

HYPOTHESIS

HYPOTHESIS H(0): There will be no significant effect in application of both kinesiology taping with exercises and rigid taping with exercises in shoulder impingement syndrome among cricket players.

HYPOTHESIS H(1): There will be a significant effect in application of kinesiology taping with exercises in shoulder impingement syndrome among cricket players.

HYPOTHESIS H(2): There will be a significant effect in application of rigid taping with exercises in shoulder impingement syndrome among cricket players.

REVIEW OF LITRATURE

Helan host et al., (2014) stated that there is a poor scapulo-humeral rhythm during scapular kinematics and it can be corrected by taping the scapula.

Sood shita., sen siddharth (2014) stated that proprioceptive inhibition can be done by scapular taping for scapular dyskinesia.

Amir Masood Arab et al., (2013) stated that kinesiology taping can produce improvement in pain intensity and movement in patients with shoulder impingement syndrome.

Aliah F Shaken, Antony M.J Bull et al., (2013) elastic tape positions the scapula more posteriorly and scapula rotation in scapular pain.

F.Shruge.J.Nijs (2012) stated that focused treatment for the scapula showed more results in treating shoulder impingement syndrome.

Joei, Adrian.T, Apeldoon et al., (2011) stated that corrective taping showed better results with taping and exercises.

Zaparatidisl, Vasreltes et al., (2011) stated that male performed better than female in motor abilities that are important for shoulder function.

Steven benhersn, jefrey et al., (2010) internal impingement is common cause of shoulder pain in throwing.

Todd's Ellenbecker, Ann cools et al., (2010) stated that strengthening rotator cuff showed better results in rehabilitation of shoulder impingement syndrome.

Erkankaya, Muatzinnuogle et al., (2010) kinesiology taping can be alternative treatment option in treatment of shoulder impingement syndrome when immediate effect is needed.

John.E. Kuhn et al., (2009) stated progressive resisted exercise in shoulder impingement syndrome showed more results in rehabilitation.

Yung – chin che (2007) stated that females have less throwing velocity compared to males.

David M. Selkowitz, Cassey, Chany et al., (2007) scapular taping decreased upper trapezius and increases the activity of lower trapezius activity in people with shoulder impingement syndrome.

Hsu – kun che et al., (2006) found that elastic tape is significantly increased scapular tilt. **Bosrsfod et al., (2006)** has investigated the effectiveness of tape and kinematics for altered scapular reposition.

Lisa Am will et al., (2005) stated that early introduction of conservative management is recommended for beneficial and optimal outcome impairment with shoulder impingement syndrome.

Akendra Kirkley, Kate, et al., (2003) has designed scores to test functional performance of shoulder.

Herbert et al., (2002) stated that scapular internal rotation as an indicator for the severity of shoulder impingement syndrome.

Tndo et al., (2001) stated that shoulder impingement syndrome has been associated with decreased scapular upward rotation and posterior tilt.

Cook et al., (2000) stated that patients with shoulder impingement syndrome have more scapular internal rotation.

Bemmet et al., (2000) taping helps in biomechanical realignment of scapula in scapular dyskinesia.

Lukasicwic et al., (1999) stated that there is an exacerbation in condition by narrowing in sub acromial space in scapular dyskinesia.

Host et al., (1995) has suggested that taping alters the fore in scapular kinematics.

METHODOLOGY

MATERIALS USED:

- kinesiology tape
- under wrap
- rigid tape
- synthetic cricket ball
- measurement tape
- stop watch
- resistance tube (3-5)

STUDY DESIGN : Experimental design

SAMPLING METHOD : Convenient

SAMPLE SIZE : 30 Subjects (Group-A- 15 & Group-B- 15)

STUDY DURATION : 4 weeks

STUDY SETTING : SPORTS PERFORMANCE ASSESSMENT REHABILITATION RESEARCH COUNSELING INSTITUTE (SPARRC), Plot No. 936, Door No. 166, 6 th Avenue, Anna nagar, Chennai – 600040.

Figure-1 Materials Used

INCLUSION CRITERIA

- Cricketers (off season)
- Male
- Age 18-30 Years
- Scapula dyskinesia
- Shoulder impingement syndrome
- Subjects willing to participate
- Subject with regular practice for 2 years (6 days a week).

EXCLUSION CRITERIA

- History of dislocation or traumatic injuries on the tested shoulder Complex History of shoulder surgery within the last 6months
- Failure to complete two testing sessions

OUTCOME MEASURES

NUMERICAL PAIN RATING SCALE

The subjects were asked take three pain ratings, corresponding to current, best and worst pain experienced. The average of three rating was used to represent the subject's level of pain[11].

FUNCTIONAL THROWING PERFORMANCE INDEX

The functional ability the shoulder was assessed by using FTPI. The subject stood 4.57 m from a target. The target was set as 30.48 by 30.48-cm square on a wall at a height of 1.22 m from the floor. The object of the test was to throw a rubber playground ball into the target as many times as possible over three 30-second trial for his pretest. Before testing, subjects performed 8 throws as a warm-up. Then the final value will be obtained by dividing the total number of throws and number of accurate throws[13].

PROCEDURE

All subjects were given the informed consent and the procedure was explained in detail. First the Numerical Pain Rating Scale is obtained from the subjects and Functional throwing performing index was performed to find the functional assessment of shoulder. Then the participants were divided in to two groups. Group-A subjects was applied kinesiology tape and received exercises. Group B subjects received rigid tape and exercises protocol were given. These interventions were done for 4 weeks and the post test procedure were performed after 4 weeks.

KINESIOLOGY TAPING (Group-A)

The base of the tape is fixed over the coracoid process of the distal end of the clavicle with a downward pull applied from just before the tail of the tape is attached to level of rib 6 in vertical line. Only ever applied after successful application of elevatory taping[8].

RIGID TAPING (Group-B)

Group –B were taped using rigid tape and is applied over the symptomatic side. (Lewis et al., 2005b). In the Rigid tape application, a combination pack of zinc oxide tape and protective tape was used. The protective tape was applied first with no tension. To apply the rigid tape, subjects placed their thoracic spine in a neutral position, the rigid tape was applied over the symptomatic shoulder from the first to the twelfth thoracic vertebra. Subjects were then asked to retract and depress the scapula; this was demonstrated by the investigator. Rigid tape was applied diagonally from the middle of the scapular spine to the twelfth thoracic vertebra

STRETCHING EXERCISES

- Sub-occipital muscles.
- Trapezius.
- Pectorals stretch
- Posterior deltoid

All these muscle stretches was done daily before and after exercise Hold time for stretches was for 10-20 sec and 3 sets were be performed

STRENGTHENING EXERCISES

- Rowing.
- Bracing.
- Scapular Squeeze.
- Shrugs.
- Side raise.
- Front raise.
- Internal rotation.
- External rotation

All these exercise were made to perform for 4 weeks .reps and sets was for 15 x 3 sets once a day for 4 weeks

Figure-2-Kinesiology Taping

Figure-3- Rigid Taping

Figure-4-Rowing

Figure-5-Bracing

Figure-6-Wall squeeze

Figure-7-Scapular squeeze

Figure-9-Side raise

Figure-8-Sshrugs

Figure-10-Front raise

Figure-11-Internal rotation

Figure-12-external rotation

Figure-13 Trapezius stretch

Figure-14-Deltoid stretch

Figure-15-Pectoral stretch

DATA ANALYSIS AND INTERPRETATION

ANALYSIS OF PRE AND POST TEST VALUE OF NUMERICAL PAIN RATING SCALE (NRS) OF GROUP-A KINESIO TAPING AND EXERCISES WITH GROUP-B RIGID TAPING AND EXERCISES.

The table-1 depicts comparative mean values, mean difference, standard deviation, paired 't' value and P value of pre and post test Numerical Pain Rating Scale (NRS) for Group-A Kinesio Taping with exercises and Group-B Rigid Taping with exercises Cricketers with Shoulder Impingement Syndrome.

Analysis shows that there is highly significant improvement in Group-A Kinesio Taping with exercises with the $P<0.001$ significance. This shows that there is statistically significant difference i.e pain is decreasing in the Numerical Pain Rating Scale between the Group-A Kinesio Taping with exercises and Group-B Rigid Taping with exercises Cricketers with Shoulder Impingement Syndrome.

ANALYSIS OF PRE AND POST TEST VALUE OF FUNCTIONAL THROWING PERFORMANCE INDEX (FTPI) OF GROUP-A KINESIO TAPING AND EXERCISES WITH GROUP-B RIGID TAPING AND EXERCISES.

The table-2 depicts comparative mean values, mean difference, standard deviation, paired 't' value and P value of pre and post test Functional Throwing Performance Index (FTPI) for Group-A Kinesio Taping with exercises and Group-B Rigid Taping with exercises Cricketers with Shoulder Impingement Syndrome.

Analysis shows that there is highly significant improvement in Group-A Kinesio Taping with exercises with the $P<0.001$ significance. This shows that there is statistically significant difference i.e overall function of the shoulder complex is improving in the Functional Throwing Performance Index (FTPI) between the Group-A Kinesio Taping with exercises and Group-B Rigid Taping with exercises Cricketers with Shoulder Impingement Syndrome.

DISCUSSION

This comparative study results suggest that taping techniques have effects on scapular kinematics and pain, these effects are different for both Kinesio and Rigid taping techniques, Only Kinesiology taping significantly increased scapular external rotation and thus lowering the pain and improving the performances. A number of studies have shown that patients with SIS have increased scapular internal rotation compared to a healthy control group[17]. The results in this study would suggest that both kinesiology and rigid taping techniques help in reducing the scapular internal rotation and therefore in normalizing scapular kinematics. Kinesiology taping has shown better results in correcting shoulder impingement syndrome by correcting the scapula which considered to be primary cause of this condition. In this type of proprioceptive taping for the shoulder improves the muscle activation and helps to realign the scapula to its original position.

Both taping techniques also resulted in a clinically significant reduction in pain in sagittal plane movements (difference of more than 2 on the median of NRS scores). This finding complements the results of the previous studies showing effectiveness of taping in patients with shoulder disorders. **Thelen et al.** found that KT provides an immediate effect on the limitation of the active ROM and pain during abduction with no improvements in disability scores among 42 subjects with rotator cuff tendonitis/impingement.

Kaya et al. compared the short-term efficacy of therapeutic KT application on reducing pain and disability in 55 subjects with shoulder pain due to rotator cuff problems with conventional physical therapy modalities.

Therapeutic exercise has previously been determined to have long-term benefits for patients with SIS[15,16], the application of scapular taping appeared to optimize conditions for performing the stretching and strengthening exercises. These optimum conditions may be due to the significant pain reduction and increased pain-free ROM immediately following the application of scapular taping procedures, adding to it the conventional exercise therapy might reduce pain by stimulating joint mechanoreceptor activity, which, in turn, is thought to block aberrant afferent pain signals and reduce the awareness of pain[17] . It has also been hypothesized that stretching exercises mechanically stretches shortened collagenous tissue and improves interstitial fluid content resulting in restoration of

movement [18].

There are several factors which will determine the success of a patient treatment with SIS. Firstly, improving the biomechanics of the scapulo-humeral and scapulo-thoracic joints is one that ultimately relieves the patient's symptoms. Scapular taping may be one way to improve scapular alignment.

Holding the scapula in better alignment with tape may provide a prolonged stretch to the tight structures around the shoulder. Additionally, this improvement in position helps to increase the subacromial space. Thus, the taping may relieve any excessive tension placed on the involved structures of the impingement. Muscle and collagenous tissue are both very adaptable, and studies have shown that low-load, long duration stretching is more effective than short-term, vigorous stretching [19].Taping may be one way to achieve this low-load, prolonged-duration stretching.

In this study there was an improvement in functional throwing performance index where the throwing ability was increased in kinesiology group as compared to other group by as there was an improvement of proprioception of the shoulder. Pain modulation via the gate control theory is one probable explanation for such a change. It has been speculated that tape stimulates neuromuscular pathways by increased afferent feedback.12 Increase in afferent stimulus to large- diameter nerve fibers can lessen the input received from the small-diameter nerve fibers conducting nociception. Another possibility is that the improved motion might have been due to an increase in the number of lower trapezius motor units recruited to perform the activity due to an increase in the proprioceptive stimulus[21].

The key alteration to scapular kinematics caused by taping is the reduction in scapular internal rotation, this alteration occurs mainly in the sagittal plane where a significantly reduced pain was also found.

Thus, it is reasonable to suggest that the reduction in pain could be associated with the change in the scapular internal rotation. One possible mechanism by which this reduction of pain occurs is that an externally (less internally) rotated scapula increases the sub acromial space and relieves pain caused by soft-tissue impingement; this has also been Suggested in previous studies,[22,22,23] .

CONCLUSION

From this study, it is found that Kinesiology taping with exercises techniques reduce the scapular internal rotation in patients suffering from Shoulder impingement syndrome. This effect corresponds with a reduction in the intensity of pain experienced by patients. The kinesiology taping technique positions the scapula more posteriorly and increase scapular retraction in scapular plane movements; however these alterations to kinematics did have a corresponding effect on the pain and improving functional ability of the shoulder during throwing.

This study concluded that Kinesiology taping with exercises have reduced the pain and it improves the overall functional ability of the shoulder complex. The primary goal of rehabilitation is to return the player to his sport as quickly as possible. This technique definitely will help them for a faster and better recovery.

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ANNEXURE- I

INFORMED CONSENT FORM

I, Mr./ Ms./ Mrs. _____ Aged _____

have been properly explained about the procedure andconsequences of the study. I voluntarily agree to participate in the study on " TO COMPARE THE EFFECTIVENESS OF KINESIOLOGY TAPING AND EXERCISES WITH RIGID TAPING AND EXERCISES ON SHOULDER IMPINGEMENT SYNDROME IN CRICKETERS", conducted by M.ASHOK KUMAR of MOHAMED SATHAK A.J COLLEGE OF PHYSIOTHERAPY, Nungambakkam, Chennai- 600034. All the information given by me will be kept strictly confidential and should be used only for research purpose. I have the option of discontinuing at any point of time according to my personal needs or reasons. I surely solely give consent to participate in the study.

Date :

Place : Signature:

ANNEXURE II

ASSESSMENT CHART

NAME :

AGE :

SIDE :

YEARS OF PLAY :

No. OF DAYS PER WEEK:

NUMERICAL PAIN RATING SCALE:

FUNCTIONAL THROWING PERFORMANCE INDEX:

DISTANCE : 15 feet from the wall
HEIGHT : 4 feet from the floor
TARGET SIZE : 1 X 1 foot
BALL DIA : Synthetic cricket ball

INSTRUCTIONS :

- Normal throwing is encouraged, subjects should use the 'crow-hop'
- 8 warm up throws is performed before pre test.
- Participants should catch the ball when it rebounds and throw.
- Three 30 seconds pre test and post test throws performed.
- FTPI(%)= Throws in Target/ Total no. of throws X 100

Trials	1	2	3
Accurate Throws			
Total No. Throws			